COUNTY OF YORK
MEMORANDUM

DATE: April 9, 1999 (BOS Mtg. 4/21/99)

TO: York County Board of Supervisors

FROM: Daniel M. Stuck, County Administrator

SUBJECT: Application No. UP-541-98, Virginia Power

ISSUE

Application No. UP-541-98 requests an amendment to Resolution No. R82-221(R-2) to authorize the removal of stockpiled fly ash material on a 182-acre parcel adjacent to Old York-Hampton Highway (Route 634). The parcel is further identified as Assessor's Parcel No. 24-204.

DESCRIPTION

- Property Owner: Virginia Power
- Location: Adjacent to Old York-Hampton Highway (Route 634)
- Area: 182 acres
- Frontage: Approximately 2,800 feet on Old York-Hampton Highway
- Utilities: Public water and sewer are available
- Topography: Naturally flat; sloping mounds of stockpiled material
- 2010 Land Use Map Designation: General Industrial
- Zoning Classification: IG - General Industrial
- Existing Development: Virginia Power fly ash deposition and storage site; York County Industrial Development Authority shell building
- Surrounding Development:

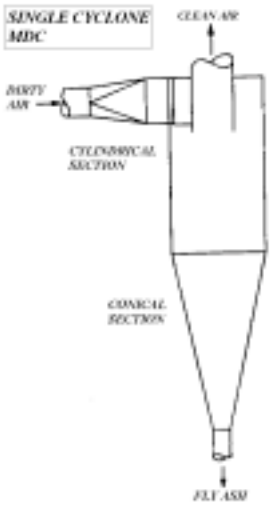
  North: Undeveloped Virginia Power property; single-family homes on Hornsbyville Road beyond
  East: Old York-Hampton Highway; Limited Industrial activities and several nonconforming single-family homes beyond
  South: York County waste transfer station

West: Undeveloped industrial property

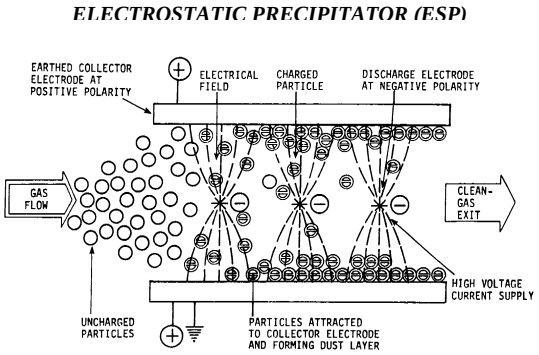
- Proposed Development: Removal of stockpiled fly ash

VIRGINIA POWER – YORKTOWN POWER PLANT HISTORY

The Virginia Power (Virginia Electric and Power Company – *VEPCO* – referred to as *Virginia Power* throughout) – Yorktown Power Station (YPS) began operation in 1957 with the completion of the 180-megawatt Unit No. 1. The 180-megawatt Unit No. 2 was completed in 1958 and the 875-megawatt Unit No. 3 was completed in 1972. Units 1 and 2 burn coal and Unit 3 burns oil and/or natural gas. These three units generate enough power to supply approximately 6% of the power needs of Virginia Power's customers in southeastern Virginia and northeastern North Carolina. York County was chosen as the location for a Virginia Power facility for several reasons, including proximity to the York River and the existence of the Amoco Oil refinery. Because the refinery was already built, the infrastructure to support a power production facility (i.e. rail spur, docking facilities for large ships, water supply, etc.) were already in place. In addition, Units 1 and 2 were designed to have the ability to burn delayed petroleum-coke (pet-coke), which is one of the waste byproducts of oil refining. Coal and pet-coke were burned in Unit 1 and 2 until 1972.



YPS used mechanical dust collectors (MDCs) as the primary pollution control equipment from 1957 until 1969. MDCs are relatively simple devices that force dirty air into a conical cylinder away from the centerline, which creates a violent swirl within the cone. The heavy particulates migrate to the wall of the cylinder by centrifugal action and friction causes the particles to slow down and exit at the bottom of the cone. The clean air in the middle of the cylinder then exits out of the top.[1] The YPS MDCs remove approximately 40% of the particulate matter from the flue gases before they exit the stack. In addition to the MDC, an electrostatic precipitator (ESP) was installed on Unit 1 in 1969, raising the particulate removal rate for that unit to 98 percent. ESPs are more than twice as efficient as the MDCs and are capable of removing much smaller particles from the air. The particles are removed from the gas stream by being charged by electrons jumping from one high-voltage electrode to another and then migrating to a positively charged collecting



1 P. Aarne Vesilind, et al., *Environmental Pollution and Control, Third Edition,* (Massachusetts: Butterworth-Heinemann, 1990), p. 303.

electrode. A mechanical or sonic "rapper" then removes the particulates collected on the electrodes by vibrating the electrodes until the material falls into a collection bin.[2] The collected particles from the MDC and the ESP are called "fly ash" because the particles are caught as they "fly" through the exhaust stream. Though the addition of the ESP to Unit 1 improved the quality of the air exiting its stack, Unit 2 continued operation with only the MDC. The poor air quality emitted by Unit 2 and the remaining emissions from Unit 1 created an opaque, particulate-rich plume exiting the stacks. The suspended particles eventually fell out of the air column onto the residential properties of Waterview, Dandy, and Seaford.

On June 27, 1972 a Consent Order was entered by the York County Circuit Court, which precluded Virginia Power from using any fuel at the Yorktown station other than oil or gas. This Order was a product of a series of criminal public nuisance proceedings brought against Virginia Power as a result of the offensive air pollution from the burning of coal and pet-coke. As dictated by the Consent Order, Virginia Power converted Units 1 and 2 to oil in 1974 and 1973, respectively. Also in 1974, the 875-megawatt oil-fired Unit No. 3 began operation.

Prompted by federal objectives for a reduction in dependence on oil, Virginia Power submitted Application No. 82-UP1 in 1982 to convert Units 1 and 2 back to coal. After multiple committee reviews and public hearings, the Board approved Application No. 82-UP1 on January 20, 1983 with the adoption of Resolution No. R82-221(R-2) with its 96 conditions.[3] The community had lingering concerns about the environmental safety of burning pet-coke, however, and YPS was not allowed to reuse it as a fuel. The conditions established by Resolution No. R82-221(R-2) are arranged in five major categories and address many aspects of the power production and waste elimination process.

FLY ASH

As previously mentioned, fly ash is the waste product removed from the exhaust air by the MDCs and ESPs. Particle size and shape characteristics of fly ash are dependent upon the source and uniformity of the coal, the degree of pulverization prior to burning, and the type of collection system used.[4] More than 95 percent of ash is made up of silicon, aluminum, iron, and calcium in their oxide forms, with magnesium, potassium, sodium, and titanium representing the remaining major constituents. Ash may also contain a wide range of trace constituents in highly variable concentrations. Potential trace elements include antimony, arsenic, barium, cadmium, chromium, lead, mercury, selenium, strontium, zinc, and other metals.[5]

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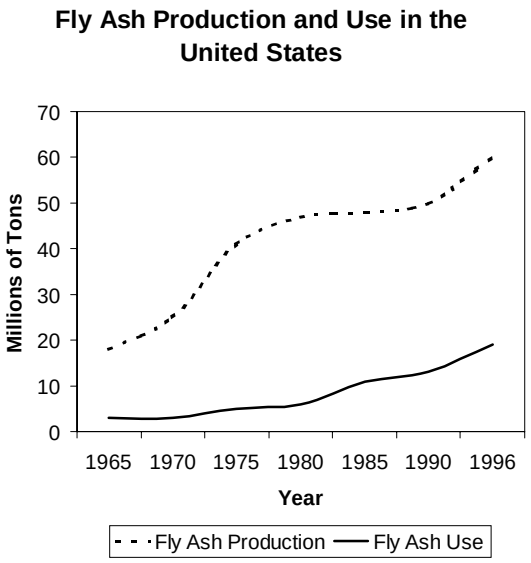
2 Ibid., p.304.

3 Memorandum from J. Mark Carter to Daniel M. Stuck. January 22, 1991. *Virginia Power Company – Yorktown Power Plant, Operational History Briefing*.

4 Fly Ash Resource Center, *"Materials Research,"* Internet site, 2/11/99.

5 United States Environmental Protection Agency, Office of Compliance Sector Notebook Project, *Profile of the Fossil Fuel Electric Power Generation Industry, September 1997*. p.41-42.

Prior to the waste disposal regulations promulgated by the United States Environmental Protection Agency (EPA) in the 1970s, fly ash was often disposed of in open, unlined areas. Between 1957 and 1974, Virginia Power employed a private contractor to haul fly ash from YPS. The fly ash was deposited in four abandoned sand and gravel borrow pits in the vicinity of Chisman Creek. Erosion control measures were inadequate and ash from the disposal areas entered Chisman Creek and its tributaries. In 1980, a domestic well along Wolf Trap Road was reported to have discolored water. Studies found elevated concentrations of heavy metals in the ground water, surface water, and soil. The site was included on the National Priorities List in 1983, based on the aforementioned study results. Remedial action related to the ash disposal sites began in November 1987 and was completed in 1988.[6] After the EPA determined that the area no longer posed a health risk, York County and Virginia Power developed the sites as public recreation areas (Chisman Creek and Wolf Trap parks).



Technical knowledge of fly ash and its relation to public health has changed greatly since the open-pit disposal methods of past decades. Pet-coke fly ash and coal fly ash are not considered the same: because of the increased presence of carbon in pet-coke, its reuse is less feasible and it is most often disposed of in a landfill designed to accept industrial waste or as fill material for mine reclamation projects. The EPA does not regulate fly ash as a hazardous waste. In its 1988 Report to Congress, the EPA concluded, "coal combustion waste streams generally do not exhibit hazardous characteristics under current … regulations. EPA does not intend to regulate … fly ash."[7] In addition, it "encourages the utilization of coal combustion wastes as one method for reducing the amount of these wastes that need to be disposed ... The Agency supports voluntary efforts by industry to investigate additional possibilities for utilizing coal combustion wastes."[8] Coal fly ash has become a valuable building material, particularly as an additive in cement mix.[9] YPS has been selling its fly ash to a private company that removes the material as soon as it is released from the temporary storage silos located at the plant. The permanent storage facility located on the subject parcel has not been actively used as a large-scale disposal site for approximately 4 years. Road construction projects in the area

6 United States Environmental Protection Agency, *Superfund Program Fact Sheet, E.P.A. Region III, Chisman Creek Site, York County, Virginia,* p.2-6. February, 1988.
7 United States Environmental Protection Agency, *1988 Report to Congress: Wastes from the Combustion of Coal by Electric Utility Plants, Executive Summary*, p. ES-6.
8 Ibid. p. ES-8.
9 Cote, Carrie M., "Fly Ash Characterization," *The Use of Blended Cements to Reduce CO_2 Emissions from the Cement Industry*, ed. Northwestern University Department of Civil Engineering. p.1.

CURRENT AND POTENTIAL USES FOR FLY ASH

CURRENT USES	*POTENTIAL USES*
Flowable Fill	Ingredient of golf ball coverings
Soil stabilization	Flue gas reactants
Lightweight aggregate building material	An additive to sewage sludge for use as a soil conditioner
Roofing materials	
Roofing granules	
Plastics, paint	
Filter cloth precoat for sludge dewatering	
Pipe bedding	
Structural fills	
Concrete and block Portland cement	
Mine reclamation	
Agricultural enhancement	
Road paving: as a sub-base or fill material under a paved road	
An alkali reactivity minimizer in concrete aggregate	
The footprint of a structure, a paved parking lot, sidewalk, walkway, or similar structure	

have created a local shortage of fill material, making the removal of the YPS fly ash stockpile economically feasible. The applicant estimates that, should another project similar to the Interstate 64 - Grove interchange begin in the near future and should Virginia Power be selected to provide fill material, the fly ash stockpile could be completely depleted within one year.

The original plan for the facility was to develop an industrial park on top of the ash stockpile, which is above grade (thus the requirements for compaction testing, etc. in the original resolution). That plan has not changed – the GAI study titled "Closure/Post-Closure Plan, Ash Structural Fill Facility Closure, Yorktown Power Station, York County, Virginia," included with the use permit application, details the condition that the site must be in prior to official closure (i.e., groundwater monitoring, surface water drainage, maintenance plan, inspection plan, etc.). The study states that the site "will be closed and left in a condition to allow for light industrial or commercial development. Engineered foundation, utility, and drainage systems will be incorporated as part of the development." A condition as been included in the proposed resolution to ensure that closure of the site is in accordance with the aforementioned GAI study.

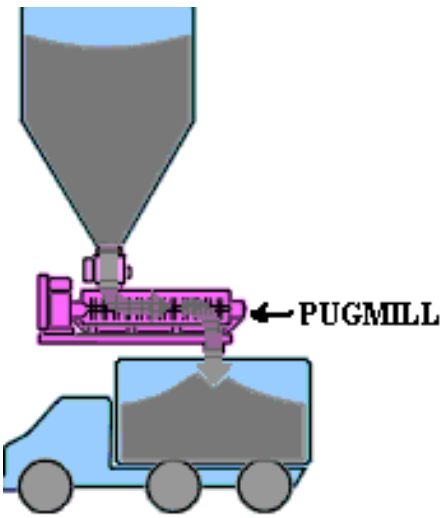
USE PERMIT MODIFICATION CONSIDERATONS

The applicant has proposed modifications to seven of the existing use permit conditions, as well as two additional conditions. The proposed modifications to conditions A(6)(a), A(6)(b), A(8), A(22), A(23), and A(27) would allow temporary stockpiling of fly ash on the site and the removal of the temporarily stockpiled material as well as the material already deposited in what were initially envisioned as permanent disposal cells. The amended conditions also remove the requirement for density testing of stockpiled fly ash

if it is to be recycled. These changes are not expected to have any detrimental effects on Virginia Power's neighbors or the County in general.

The proposed amendment to condition C(19) is as much a request of the York County Industrial Development Authority (IDA) as it is of Virginia Power. The existing use permit, as written in 1982, assumed that a majority of the rear portion of the 182-acre site would be used for fly ash disposal and included a condition to retain a 200-foot vegetated buffer along Old York-Hampton Highway. As previously mentioned, Virginia Power has not used this site for large-scale ash disposal in approximately 4 years. Consequently, only 5 of the 13 available ash "cells" have been developed. Each ash "cell" occupies approximately 3-5 acres of the site and is designed with the idea that it may eventually support development. Because Virginia Power does not intend to use the site for further ash disposal, it has entered into an agreement with the IDA to develop the site as the York River Commerce Park. Virginia Power has subdivided 30 acres of the southeastern portion of the site into three ten-acre parcels: the IDA shell building is constructed on one of the three parcels. Virginia Power and the IDA wish to have this buffer reduced so that the lots fronting Old York-Hampton Highway are not encumbered with a 200-foot buffer. The property across the street from the subject parcel is zoned IL (Limited Industrial). The Zoning Ordinance requires a Type-25 (25-foot) transitional buffer between the IL and IG zoning districts. Because the Virginia Department of Transportation (VDOT) right-of-way reserved for Old York-Hampton Highway is over 90 feet in width, a transitional buffer is no longer required. Because Virginia Power has chosen to leave the remaining eight "cells" undeveloped and because the area between the fill site and Old York-Hampton Highway is being developed as an industrial park, the 200-foot buffer should no longer be necessary. However, a Type-25 buffer is warranted because of the uncertain nature of development in the remainder of the industrial park. In addition, there are several nonconforming single-family homes along Old York-Hampton Highway. While these are nonconforming uses, they could potentially be adversely affected by elimination of the buffer and would benefit from the retention of a 25-foot transitional buffer.

The applicant has proposed two additional conditions to the existing use permit. Proposed condition No. A(32) seeks to establish the use of a pugmill to mix the fly ash and cement on-site. A pugmill is essentially a large mixer, similar in size and shape to the trailer portion of an 18-wheeler. The pugmill receives a rough mix of concrete, water, and fly ash from a silo and combines the three into a homogenous mixture to be fed into haul trucks and moved off-site. While this will increase the amount of noise generated on the subject parcel, it may be



comparable to what would be generated by some of the uses that are permitted as a matter of right in the IG zoning district (i.e. truck terminal, machine shop, etc.). In addition, the pugmill will operate on fly ash "cell" sites 1-5 which are roughly in the center of the 182-acre parcel. The large distance from the pugmill to the edges of the property will help abate any noise before it spills over to other properties.

Lastly, proposed condition No. A(33) seeks to improve the entrance to the ash site on Wolf Trap Road to accommodate the additional truck traffic to be created by the removal operation. The actual number of trucks exiting the site per hour varies according to the magnitude of the project needing the fly ash material; accordingly, VDOT has recommended that the entrance be upgraded according to the worst-case scenario of 800 additional vehicle trips per day. Wolf Trap Road currently operates at an "A" (free-flow) peak hour level of service; the additional trips will not affect that rating. In addition, VDOT has suggested that Virginia Power post a bond in the amount of $25,000 to cover any road damage that may occur as a result of the heavy truck traffic. There is a condition in the proposed resolution to that effect.

PLANNING COMMISSION RECOMMENDATION

The Commission, subsequent to conducting a public hearing on March 9th during which no opposition was expressed, voted 5:0:1 (Semmes abstaining) for a recommendation of approval.

COUNTY ADMINISTRATOR RECOMMENDATION

Fly ash has been a source of concern and anxiety for some County residents since discovery of the "Superfund" sites in the 1980s. Despite reassurances from the EPA stating otherwise, rumors of "fly ash contamination" at various sites persist. The EPA has determined that fly ash is not a hazardous substance and encourages the reuse of this waste product for concrete mixing and other road construction uses. Because of the local shortage in available fill material, it has become economically feasible for Virginia Power to investigate the possibility of removing its large stockpile of ash. This ash may be used in local road construction projects, achieving the two-fold benefit of eliminating the need to store this waste product in the County and reducing the number of unsightly borrow pits necessary to acquire fill material. The existing use permit prohibits the removal of fly ash once it is placed at the permanent storage facility on the subject parcel, which discourages reuse of the fly ash *and* the site itself. The York County IDA believes that the shell building located on the property will spark development of the York River Commerce Park and turn what is essentially a large storage bin for fly ash into a revenue-generating industrial park. The opportunity to remove fly ash and redevelop the disposal site represents a benefit to the County. In addition, the effort to recycle waste products in a responsible manner should be encouraged whenever possible.

Concerns were raised at the Planning Commission meeting regarding the applicant's estimated worst-case scenario of 800 vehicle trips per day. Staff has discussed this matter with the applicant and has agreed to a maximum of 400 vehicle trips per day (200 trips into the site and 200 trips out). This number will allow the applicant to profitably remove the fly ash from the site while still respecting the interests of public safety. Staff has added this limit to condition A33 to ensure that this project will generate no more than 400 vehicle trips per day.

The remaining conditions in Resolution No. 82-221(R-2) address all other aspects of the ash hauling operation as well as site, employee, and truck safety. Therefore, I recommend approval, subject to the conditions contained within Resolution No. R99-69.

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Attachments

- Excerpts from unapproved Planning Commission minutes, 3/9/99
- Zoning Map
- Aerial photos (2)
- Proposed conditional use permit changes submitted by applicant, dated 2/6/99
- Resolution No. 82-221(R-2)
- Proposed Resolution No. R99-69